There's no place like home.
Dorothy, *The Wizard of Oz*

ENVIRONMENTAL JUSTICE

Double Jeopardy?

The U.S. prison population grew from 1.1 million in 1990 to over 1.96 million in 2001, according to the U.S. Department of Justice, and more prisons have been built to meet the need for greater capacity. But societal and economic pressures often mean prisons are built on sites that may be contaminated by hazardous industrial waste. And while it's relatively easy for a neighborhood group or business to request a test or press for compliance, prison inmates have greatly restricted access to information and legal instruments.

"Prisoners are not a high priority in our society, and won't ever be. It's a group that's very vulnerable," says Anna Harding, chair of the Department of Public Health at Oregon State University. When environmental problems arise, Harding adds, neither inmates nor prison workers "receive the attention a mainstream community would."

The issue is hard to track due to a dearth of information—no database cross-references prison land use with environmental hazards. But a decade ago, Jan Elvin, editor of the American Civil Liberties Union's *National Prison Project Journal*, noted in that publication's Fall 1991 issue that neighborhood reluctance to have either prisons or hazardous waste disposal facilities nearby was forcing both toward rural or low-income areas eager for jobs. Privatization of prisons adds another wrinkle to the problem. A February 2001 Department of Justice report titled *Emerging Issues on Privatized Prisons* notes the "dramatic increase in prison and jail populations" and the need for new facilities. According to the report, low-bidding private companies can sometimes build a facility in half the time that governments require, in part "because private firms are not bound by governmental rules that tend to slow down prison construction"—including environmental and public health studies.

In November 1998, Harding arranged for an evaluation to be conducted at Oregon State Prison in Salem by the Agency for Toxic Substances and Disease Registry after a concerned community group asked the university for advice. For years, the prison's dry cleaner had unknowingly released the solvents perchloroethylene (PCE) and trichloroethylene (TCE) into the groundwater. Inmates and workers drank contaminated well water and breathed airborne PCE and TCE until 1989, when the prison went to city water. The U.S. Environmental Protection Agency classifies PCE and TCE as known human carcinogens.

According to Harding, the evaluation found "fairly high" levels of PCE and TCE—over 3 times and over 12 times the federal standard, respectively. "Probably the highest risks were to guards who [patrolled] the shower area for eight hours a day," says Harding; inhaling warm water vapors for long periods would constitute a greater exposure than drinking the water. Although the Oregon Department of Environmental Quality cleaned up the plume—which extended into the neighborhood beside the prison—and continues to sample a monitoring well, in May 2001 a federal judge dismissed on procedural grounds a class action suit filed by more than 1,000 former and current inmates and a few former prison employees for harm from the exposure.

Another questionable case involves a Colorado prison. For years a uranium mill near Cañon City produced highly radioactive uranium ore; its unlined storage basins became a Superfund site in 1984. Just five miles from the uranium mill stands a privately built prison complex designed for 2,450 inmates and employing several hundred guards and other workers. During its construction, officials noted environmental risks to the area's groundwater, and demonstrators expressed concern over the prison's proximity to the uranium mill. The Colorado Department of Public Health and Environment says there is little threat of contamination for inmates, and models of underground uranium and molybdenum plumes suggest they do not affect the prison's groundwater. However, in November 2001 a federal judge awarded $43 million to residents of nearby Lincoln Park for cases of cancer and other illnesses stemming from radiation poisoning due to the mill.

Correctional Corporation of America, the largest private operator of U.S. prisons, recognizes that redevelopment incentives strengthen the need for due diligence in its environmental assessments. For example, brownfields redevelopment programs combine tax incentives with the responsibility of developers for testing the sites for toxic residues and guaranteeing their compliance. "In general, we try to avoid environmental issues with our properties," says Linda Staley, corporation vice president for design and construction management.

Edward Harrison, president of the National Commission on Correctional Health Care, welcomes research on any linkage between hazardous waste sites and prison health. "If there's found to be a cluster of health problems," he says, "we need to alert the health staffs at the prisons so they can address it." **–David A. Taylor**

Cruel and unusual? Critics charge that prisons are being built on hazardous waste sites without proper consideration of inmate and employee health.

Taxi

Conservation

A Luxury Tax on Energy

Aspen, Colorado, already known for its ski slopes, is trying to become known as well for its efforts to conserve energy and decrease power plant carbon dioxide emissions. Under the joint city/county Renewable Energy Mitigation Program (REMP), people who build large new homes in Aspen are given a budget for how much energy they can use to run their households. Exceed that budget, homeowners are told, and they must pay a fee.

Fees are based on a house's size. For houses between 5,000 and 10,000 square feet, the fee is $5,000. A house over 10,000 square feet costs twice that amount. Outdoor amenities such as a pool or a heated driveway incur further fees. Homeowners also have the choice of offsetting part of their fossil fuel consumption by installing renewable energy systems in their new digs.

The cost of consumption. Aspen hopes to distribute energy benefits equitably.

Since its inception in January 2000, REMP has collected about $1.5 million. The money, administered by Aspen's nonprofit Community Office for Resource Efficiency (CORE), is used to fund select energy efficiency projects and purchase energy from alternative sources.

The idea grew out of discussions by local officials on ways to improve energy efficiency, explains CORE director Randy Udall. Initially, he says, there was concern that such a plan would merely "give rich people a license to pollute" (U.S. Census figures peg the median Aspen home at $750,000, compared with $166,600 for the rest of the state). But in the end Udall and local officials decided that the idea was justified if the fees could be used to do environmental good by offsetting the impact of large homes and their amenities.

According to CORE's 2001 annual report, the program has doled out $666,600 for projects including solar hot water panels for an affordable housing complex and an energy-efficient lighting plan for a local sports complex. Udall says REMP now spends $50,000 per year on wind power, which he estimates will keep 40 million pounds of carbon dioxide out of the air over the next 10 years.

The program also has earmarked funds for $100 rebates to residents who buy water- and energy-efficient clothes washers, but this program has so far had only 17 takers. The annual report notes that more marketing is needed to increase residents' awareness of the washer program.

"We are beginning to see more people install renewable energy systems in lieu of paying the REMP fees," says Udall. But he can't say for certain whether this reflects an interest in energy consciousness or in expediency. "[W]hether the owners—millionaires or better—give a damn about energy usage is anyone's guess," he says. "In general, I would hazard to say no."

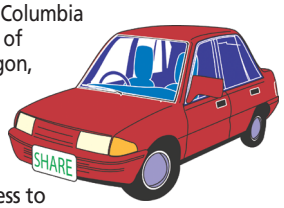
"REMP is a perfect example of how to make economic principles work to save the environment," says Thomas Drennen, an assistant professor of economics at Hobart and William Smith Colleges in Geneva, New York. "It gives housing consumers a choice—if they're going to exceed a certain 'fair' level of energy consumption, then they'll have to pay to offset it elsewhere. So if they want heated driveways, then they'll have to help fund home conservation efforts for others, such as through weatherization programs or efficient lighting programs."

Kenneth Richards, a lawyer and economist at the Indiana University School of Public and Environmental Affairs, says the program has the virtue of being easy to administer—the money is simply used to fund projects, and there is little bureaucracy or red tape involved. But Richard Shaten, a faculty associate with the Institute for Environmental Studies at the University of Wisconsin–Madison, is concerned that programs such as REMP send the message that "if rich people want to do something about [pollution], they can, but for the rest of us it's obviously too expensive."

Still, Shaten also says REMP shows that people can make a difference by living sustainably. Udall says he's considering expanding the program to Vail, another well-heeled community, where half the homes cost $369,100 or more. **–Harvey Black**

U.S. Drivers Learn to Share

Car sharing programs are beginning to gain momentum in the United States, after several successful years in Europe and Canada. U.S. programs managed by Flexcar, a Seattle-based company founded in 1999, have grown to serve residents in the District of Columbia and in metropolitan areas of California, Maryland, Oregon, Washington, and Virginia.



Currently 8,000 people take advantage of the company's fleets, which provide ready access to environmentally friendly late-model vehicles, including pickup trucks and vans. Car sharing decreases air pollution, fuel consumption, and traffic and parking congestion, and increases the use of public transportation, as vehicle pickup sites are usually sited to take advantage of bus and subway routes.

Smoke-Free Dorms a Success

A study conducted at the University of Iowa has found that student smoking rates markedly declined—from 41% in 1997 to 28% in 2001—thanks to the 1998 institution of smoke-free floors in residence halls and the 2000 ban on smoking in campus residences altogether. The study is part of ongoing student health survey that has been conduced every other year since 1991.

A similar study, performed at the University of Minnesota, where no curbs on smoking have been enacted, found that smoking rates increased there between 1991 and 1998, to 48.5%. Iowa researcher Christopher Squier noted that between 1991 and 1998 smoking prevalences at the two universities were similar. Both schools were seeing steady increases until Iowa began its smoke-free policies, which were accompanied by a campus marketing campaign, quit-smoking contests, and tobacco cessation services.

U.K. FoneBak

Each year 15 million mobile phones and phone accessories such as batteries and chargers are discarded in the United Kingdom, adding up to 1,500 tons of potentially toxic waste, including cadmium. To help keep this waste out of landfills, British company Shields Environmental,along with the five main U.K. mobile phone service providers and one of its largest mobile phone retailers, launched the groundbreaking FoneBak recycling program in September 2002.

The program is one step ahead of a European Union directive requiring manufacturers and distributors to assume responsibility for recycling of these items by 2004. Shields has projected that profits from the sale of used parts recovered from the phones will cover the cost of the program and will also help pay for consumer participation incentives.

Clockwise from left: PhotoDisc; ArtEx; PhotoDisc

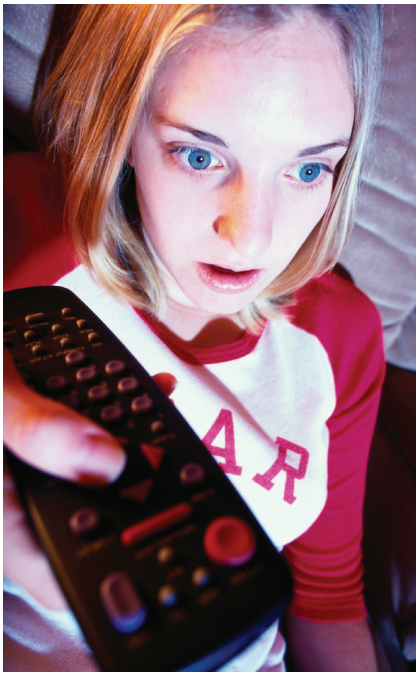
ENERGY

Vampire Appliances

You flip off the lights, but an eerie glow remains—the displays and clocks of your cable TV box, VCR, and stereo. These so-called vampire appliances stay awake all night, every night, sucking up an average of 5% of the monthly electric bill, according to Alan Meier, a staff scientist at Lawrence Berkeley National Laboratory (LBNL) in California.

In the 1998 LBNL report *Reducing Electricity to 1 Watt*, Meier and colleagues estimated this standby power use costs U.S. consumers $3 billion a year, or about $200 per household. This hidden energy use—often generated by fossil fuel power plants—contributes to the production of greenhouse gases, including about 1% of the world's carbon dioxide emissions, according to the International Energy Agency.

TV satellite boxes are one of the biggest standby power guzzlers, using anywhere from 7 to 40 watts, says Meier, partly because they must maintain a continuous connection to the satellite system. Other heavy users include devices with remote controls such as TVs and VCRs, which use an average of 5–7.6 watts. Receivers inside these appliances must stay on at all times, ready to receive a signal from the remote. Appliances that provide clock displays and timers also use quite a bit of standby power (3 watts on average).



Energy drain. Standby power—the juice that makes remote controls so convenient to use—sucks up $3 billion in electricity costs each year.

Though costs vary, Meier and other researchers contend that it is technically possible for all manufacturers to reduce standby power use to less than 1 watt per appliance without sacrificing convenience or increasing retail prices. Meier says that in U.S. homes alone, a 1-watt limit would cut standby usage by about two-thirds, for a savings of more than 4 gigawatts (the output of four very large nuclear or coal power plants). Shifting to a 1-watt standard further means cutting global carbon dioxide emissions by roughly 0.5%, Meier says.

LBNL lists appliances that use 1 watt or less of standby power on its website at **http://standby.lbl.gov/DATA/1WProducts.html**. Perhaps the easiest way to buy a standby-efficient appliance is to look for the U.S. Environmental Protection Agency's Energy Star label, which for consumer electronics (such as televisions and VCRs) signifies that the item uses 1 watt or less of standby power (Energy Star does not apply this same standard to office equipment such as computers, or to large appliances). Also, the September 2001 issue of *Consumer Reports* rates the standby power usage of TV satellite boxes.

Another solution, says Karen Herter, a principal research associate at LBNL who has worked with Meier, is replacing older transformers—the linear power supplies that convert electricity into a lower voltage that small appliances can use—with newer electronic transformers. These "switching power supplies" save power by constantly switching power on and off at a rate so fast—about 20 kilohertz—that the appliance doesn't miss the power. According to the 1998 report, replacing the estimated 1 billion "wall packs" used for cell phone chargers, lighting, and other electronics that are plugged into U.S. homes with switching power supplies could save more than a gigawatt of power.

Herter says, "I think a lot of the manufacturers are starting to recognize standby power as an issue and do something about it." Several, including Pioneer, Sony, and Matsushita, have voluntarily established targets for lower standby power levels. An incentive for other manufacturers is President Bush's July 2001 executive order that all government agencies purchase appliances that use 1 watt or less of standby power, if available.

Until all appliances reform their vampirish ways, Mark Pierce, an extension associate at Cornell University's College of Human Ecology who has written about the issue, says he reduces consumption at home by plugging his VCR and television into a power strip that he switches off when not in use. "No one's saying that we shouldn't have these conveniences," he says. "But since some manufacturers can build appliances to use less than one watt, then why can't everybody—why *shouldn't* everybody?" **–Angela Spivey**

INNOVATIVE TECHNOLOGIES

High-Tech Habitats

A series of demonstration houses in Tennessee is pushing the envelope of energy efficiency—literally. By testing tighter building exteriors, or "envelopes," and other innovations, engineers in the Building America program at the Department of Energy's Oak Ridge National Laboratory (ORNL) are learning what works and what doesn't. The houses are built by volunteers for Habitat for Humanity, and, after initial testing is completed, low-income families take possession. Close monitoring of the houses is producing data that could affect building practices nationwide, says ORNL project manager Jeff Christian.

For example, to test different heating and cooling scenarios, ORNL and Habitat have built two houses with three separate heat pumps each, and multiple heating, ventilating, and air-conditioning (HVAC) ducts. Some of the ducts run, per normal building practice, through the attic and crawl spaces, while others run only inside "conditioned" (warmed and cooled) space. The test houses show that running ducts through conditioned space saves 35% of total heating/cooling energy. Because industry has already improved the energy efficiency of furnaces and air conditioners, Christian says, "[Ductwork] is one of the last big, untapped resources in energy-efficient residential building." The less-efficient equipment will be removed before the homeowners move in.

The goal in another house built in 2002 was to cut total monthly energy bills to zero, courtesy of roof-mounted photovoltaic panels and a slew of other experimental energy technologies. This house became a "living laboratory" when the Habitat homeowner family moved in in early November 2002. ORNL and the Florida Solar Energy Center (part of the University of Central Florida in Orlando) will closely monitor total energy usage and production for 12 months.

The first month's energy bill was $54, about half the average for conventionally built Habitat houses in the same neighborhood. With help from an electricity buyback program from the Tennessee Valley Authority, expected to begin in early 2003, and further fine-tuning of the photovoltaic and HVAC systems, Christian expects the

PhotoDisc

ehpnet Habitat International Coalition

Habitat International Coalition (HIC) was founded in 1976 as the nongovernmental-organization counterpart to the United Nations (UN) Commission on Human Settlements. Although HIC began with a truly international focus, its character has evolved, and it now concentrates on the developing world. The coalition's website, located at http://www.hic-mena.org/home.htm, outlines HIC's history, overarching objectives, action plan, organizational structure, and activities, which are conducted along the governmental spectrum from the local to the international level.

In support of its objectives, HIC, which holds consultative status with the UN Economic and Social Council, conducts and sponsors seminars and conferences, publishes a variety of policy and educational materials, and promotes research in areas related to its sphere of interest. HIC's membership includes 450 advocacy groups, academic and research institutions, and individuals based in 80 countries who share the goal of improving habitat conditions in impoverished communities. HIC has played a significant role in the drafting, implemention, and defense of international housing rights standards. The coalition is striving to expand its network to include organizations focused on health and food supply issues.

The website's Documents page is the central source for conference reports, policy statements, fact-finding mission reports, and UN documents. The HIC Statements page provides a link to the coalition's declaration at the 4th Preparatory Committee Meeting for the World Summit on Sustainable Development, held in early summer 2002 in Bali, Indonesia. This declaration emphasizes how closely humans are intertwined with the natural environment and how sustainable development solutions are indispensable to the comfortable survival of the human race. The declaration also brings a newly significant environmental issue to the international development table—how large-scale human conflicts severely impact the natural environment and human health in the regions where they occur, and how they negate or reverse environmental progress that may have been made.

Visitors can access a condensed overview of international housing rights through the Solutions page. Provided here are the standing international legal provisions for environmental goods and services and for housing habitability, which calls for structures to provide shelter not only from wind and rain but also from disease vectors and environmental pollutants, and for them to be sited to allow reasonable access to food and water. **–Erin E. Dooley**

house to approach an energy cost averaging just $20 per month over a 12-month period.

Housing accounts for 20% of U.S. energy consumption. The Building America program is intended to develop, test, and promote energy-efficient housing technology. Since 1995, Building America has helped build 18,000 homes. Project staff promote energy efficiency at 18 trade shows each year, but the Habitat demonstration houses help get the word out in a different way, says Christian: "With each Habitat house, you touch fifty to one hundred local volunteers, and also the subcontractors."

Subrato Chandra, project director for the Department of Energy's Building American Industrialized Housing Partnership at the Florida Solar Energy Center, says much of the interest in energy efficiency stems from the threat of lawsuits over health problems attributed to mold [see "Mold Insurance: Crafting Coverage for a Spreading Problem," p. A100 this issue]. But he sees the result as a win–win situation. "We are finding a groundswell of enthusiasm from builders wanting to build good houses," he says. Mold can be reduced by controlling moisture and temperature, which simultaneously improves indoor air quality, increases comfort, and improves energy efficiency.

"These things all go hand in hand," Chandra says. "Once we can show that through proper construction—which also means energy-efficient construction—we can solve the mold problem, builders get excited about building better, more energy-efficient homes." **–David J. Tenenbaum**

Clockwise from left: HIC; Christopher G. Reuther/EHP; Digital Vision

Drug Use Down on the Farm

An industry survey by the Animal Health Institute, a trade group representing agro-pharmaceutical companies, found that antibiotic use by U.S. livestock farmers declined in 2001 for the third straight year. Reporting the results of the survey in October 2002, the institute said 21.8 million pounds of antibiotics were purchased for farm animals in 2001, down from 24 million in 1999. This decline in the use of antibiotics in animal production could continue. In 2002, McDonald's, Wendy's, Tyson Foods, and Perdue Farms announced that their poultry products would not contain certain antibiotics, and bills were introduced in both houses of the U.S. Congress to limit sales of animal antibiotics that are also used for treating humans.

Greenbacks for Brownfields

As part of its Brownfields Cleanup Revolving Loan Fund Pilot Program, the U.S. EPA in May 2002 awarded $21.5 million in grants to 21 state and local agencies that will distribute the funds as no- or low-interest loans to tribes, states, and other political subdivisions. These loans, which will range from $800,000 to $2 million, will be used to produce or leverage further public or private monies for the remediation of brownfield properties that have been found to contain, or that could release, substantial amounts of one or more hazardous substances. Such projects further serve to stimulate economic growth and revitalization of communities that often have been abandoned by industry because of their contamination problems.

Shanghai Says Bye-Bye to Bikes

As taxis, buses, and private cars congest roadways and contribute CO_2 and hydrocarbon emissions to the heavy haze hovering over Chinese cities, bicycles—once omnipresent throughout China—are being treated in Shanghai as traffic-snarling nuisances. Bicycles have been banned on 54 major thoroughfares, and no bicycle-friendly routes have been provided into Pudong, the city's newly built financial and industrial center. *No Bike* signs, stringent traffic fines, and planned subway lines, including the world's first high-speed magnetic levitation rail system, are part of a plan launched in 2001 to reduce bicycle use by 25% by 2005.

The number of motor vehicles is expected to quadruple by 2020 in this city where traffic growth and related NO_x emissions contributed to an 83% increase in avoidable respiratory disease cases between 1990 and 1998.